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<p>(54) Title: NUTRITIONAL SUPPLEMENT FOR FACILITATING SKELETAL MUSCLE ADAPTATION TO STRENUOUS EXERCISE AND COUNTERACTING DEFATIGATION IN ASTHENIC INDIVIDUALS</p> <p>(57) Abstract</p> <p>A nutritional supplement for facilitating the adaptation of skeletal muscle in individuals undergoing programs of strenuous exercise and counteracting defatigation and weariness in asthenic individuals is disclosed, which comprises a combination of L-carnitine, acetyl L-carnitine and propionyl L-carnitine as basic active ingredients. Optional ingredients comprise isovaleryl L-carnitine, branched-chain aminoacids and creatine and/or phosphocreatine.</p>			

Preferably, the essential amino acid mixture consists of the branched-chain amino acids valine, leucine and isoleucine.

The nutritional supplement of the invention may 5 advantageously also comprise non-essential amino acids, particularly glutamine, L-glutamic acid, L-aspartic acid and L-asparagine.

An example of the nutritional supplement of the invention comprises:

- 10 (i) from 40 to 60% by weight of a mixture of L-carnitine, acetyl L-carnitine, propionyl L-carnitine, or their pharmacologically acceptable salts;
- (ii) from 10 to 15% by weight of valine;
- 15 from 10 to 15% by weight of leucine;
- from 10 to 15% by weight of isoleucine; and
- (iii) from 8 to 12% by weight of creatine or phosphocreatine.

If non-essential amino acids are present, the nutritional supplement will also comprise from 10 to 30% by weight of such amino acids.

- 20 To all the effects and purposes of the present invention, what is meant by L-carnitine, acetyl L-carnitine, propionyl L-

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CLAIMS

1. A nutritional supplement which comprises a combination of:
 - (a) L-carnitine;
 - (b) acetyl L-carnitine;
 - (c) propionyl L-carnitine;or the pharmacologically acceptable salts thereof, and a pharmacologically acceptable excipient thereof.
2. The nutritional supplement of claim 1, wherein the weight ratio (a):(b):(c) ranges from 1:1:1 to 1:0.1:0.1.
3. The nutritional supplement of claim 2 which further comprises :
 - (d) isovaleryl L-carnitine or a pharmacologically acceptable salt thereof,wherein the weight ratio (a):(b):(c):(d) ranges from 1:1:1:1 to 1:0.1:0.1:0.1.
4. The nutritional supplement of any of the preceding claims which further comprises an essential aminoacid or mixtures thereof.
5. The nutritional supplement of claim 4 wherein the essential aminoacid is selected from the group of the branched-chain aminoacids valine, leucine and isoleucine or mixtures thereof.

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6. The nutritional supplement of claim 4, wherein the weight ratio between the combination of L-carnitine, acetyl L-carnitine, propionyl L-carnitine and the essential aminoacid or the mixture thereof ranges from 3:1 to 1:1.
7. The nutritional supplement of claims 4-6 which further comprises glutamine, L-glutamic acid, L-aspartic acid and L-asparagine.
8. The nutritional supplement of any of the preceding claims which further comprises a creatine selected from creatine and phosphocreatine.
9. The nutritional supplement of any of the preceding claims which comprises:
 - (i) from 40 to 60% by weight of a mixture of L-carnitine, acetyl L-carnitine and propionyl L-carnitine or the pharmaco logically acceptable salts thereof;
 - (ii) from 10 to 15% by weight of valine;
from 10 to 15% by weight of leucine;
from 10 to 15% by weight of isoleucine; and
 - (iii) from 8 to 12% by weight of creatine or phosphocreatine.
10. The nutritional supplement of claim 9, which further comprises from 10 to 30% by weight of non-essential aminoacids.

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